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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/698,008

10/30/2003

Yiqing Liang

685467.0010

7403

72768 7590 08/04/2008

Akin Gump LLP - Silicon Valley
3000 El Camino Real
Two Palo Alto Square, Suite 400
Palo Alto, CA 94306

EXAMINER

TORRES, JOSE

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

08/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/698,008	Applicant(s) LIANG ET AL.	
	Examiner JOSE M. TORRES	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42-82 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Comments

1. The Amendment – After Non-Final Rejection filed on April 30, 2008 has been entered and made of record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 42-45 and 48-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al. (U.S. Pub. No. 2003/0100998).

As to claims 42, 57 and 75, Brunner et al. disclose a method/computer-readable medium for characterizing animal behavior, comprising: segregating images of an animal from video images of the animal in a behavioral analysis apparatus ("Background Subtraction"), wherein the video images are taken from a top view (FIG. 15, "Top Camera **1502**", Paragraphs [0281] and [0295]); identifying at least one body part of the animal based on the images taken from a top view (Paragraph [0296]); identifying a center of mass of the animal based on the images taken from a top view (Paragraph [0296]); and characterizing/detecting behavior of the animal using the at

least one body part and the center of mass of the animal (Paragraphs [0299] and [0302]).

However, as to claims 42, 57 and 75 the embodiment disclosed in Figures 15 and 16 also include a pair of side-view cameras **1605**. In Paragraph [0142] it is stated that the addition of a second camera is an option and that it may be provided to expand the angle of vision, and gain a measurement of depth. The information obtained from the top camera **1502** (Paragraph [0281]) includes all the information necessary to identify at least one body part and the center of mass (Paragraphs [0295] and [0296]).

Therefore, in view of Brunner et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Brunner et al. system by implementing it using only one camera located at the top, as shown in Figures 15 and 16, in order to validate behavioral phenotypes associated with newly discovered genes and new drug leads (Paragraph [0005]).

As to claim 43, Brunner et al. teaches segregating images of an animal from video images includes subtracting a background image from a video image containing an image of an animal ("Background Subtraction", Paragraph [0295]).

As to claims 44, 45, 58, 59, 76 and 77, Brunner et al. teaches characterizing behavior of the animal includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to pre-trained behavior

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models/predefined rules (The positions of the anatomical features are compared to a set of decision rules. Paragraphs [0302] and [0303]).

As to claims 48-52, 70-74 and 78-82, Brunner et al. teaches the at least body part is a head, tail, waist, fore body, and hind body (“back of the animal, tail, extremities, shoulders, rump, base of tail”, Paragraphs [0276] and [0296]).

As to claims 53 and 54, Brunner et al. teaches the behavior analysis apparatus is an open field apparatus/a maze apparatus (FIG. 2, “Open Field ... Physical Challenge as an obstacle course or maze”, Paragraphs [0147] and [0243]).

As to claims 55 and 56, Brunner et al. teaches wherein the behavior analysis apparatus includes recognitions objects (“Moving an Object”)/a fear chamber (“Fear Conditioning”, Paragraphs [0147] and [0261]).

As to claim 60, Brunner et al. teaches detecting behavioral events includes detecting a turning ratio of the animal by taking a ratio of a path length traveled over a number of turns, wherein a turn is counted when the animal makes a turn larger than ninety degrees when the animal travels one body length (“Drug-Induced Turning”, Paragraph [0271]).

As to claim 61, Brunner et al. teaches detecting behavioral events includes detecting sniffing behavior of the animal by detecting when the animal's nose is in contact with a recognition object in the behavioral analysis apparatus ("Sniffing", Paragraph [0148]).

As to claim 62, Brunner et al. teaches detecting behavioral includes detecting stretch-and-attend by detecting the animal's approach to an object with fore body stretched and then lowered, followed by retraction of the fore body ("Stretch-Attend", Paragraph [0148]).

As to claim 63, Brunner et al. teaches detecting behavioral events includes detecting stay-across-areas by detecting the animal's partial incursion into a zone of the behavioral analysis apparatus (When the animal is being tested for olfactory cues, it partially perform an incursion on the baited holes (zones). Paragraph [0262]).

As to claim 64, Brunner et al. teaches detecting behavioral events includes detecting head dipping by detecting the animal's exploratory movement of its head over an edge of the behavior analysis apparatus (The head poking into a hole retrieving food performed by the animal is detected. Paragraph [0262]).

As to claim 65, Brunner et al. teaches detecting behavioral events includes detecting freezing by detecting an absence of movement of the animal's body for a period of time ("Freezing", Paragraph [0148]).

As to claim 66, Brunner et al. teaches detecting behavioral events includes detecting locomoting by detecting movement of the animal within the behavioral analysis apparatus ("Locomotion", Paragraph [0148]).

As to claim 67, Brunner et al. teaches detecting behavioral events includes detecting transgressing behavior by detecting movement of the animal from a defined zone within the behavioral analysis apparatus to another defined zone within the behavioral analysis apparatus ("Straight Alley", Paragraph [0271]).

As to claim 68, Brunner et al. teaches detecting behavioral events includes calculating a proximity score by determining a distance of the animal from a goal at predetermined time intervals ("Straight Alley", Paragraph [0271]).

As to claim 69, Brunner et al. teaches detecting behavioral events includes determining heading errors by detecting when the animal is moving away from a goal ("Orientation, Direction of Turning", Paragraph [0271]).

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4. Claims 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al. in view of Gondhalekar et al. (U.S. Pat. No. 6,837,184). The teachings of Brunner et al. have been discussed above.

As to claims 46 and 47, Brunner et al. does not explicitly disclose wherein characterizing the behavior of the animal includes determining the location of the at least one body part/center of mass of the animal in relation to a user-defined virtual zone.

Gondhalekar et al. teaches a Programmable Electronic Maze for Use in the Assessment of Animal Behavior, which comprises a programmable floor capable of constructing various obstacles and passageways. The programmable floor ("User-Define Virtual Zone") may be programmed by a human user (See Abstract, Col. 2 line 45 through Col. 3 line 46, Col. 4 lines 16-61 and Col. 5 line 20 through Col. line 12).

Therefore, in view of Gondhalekar et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Brunner et al.'s flexible subject system by incorporating the user programmable maze to create virtual zones and locating the at least one body part/center mass within the maze in order to gain insight into the effect of a drug on the behavior of the animal with a number of different mazes without transferring the animal from one maze to another (Col. 1 lines 22-45).

Response to Arguments

Claim Rejections under 35 U.S.C. §103

5. With respect to claims 42, 57 and 75, Applicant's arguments have been fully considered but they are not persuasive. Applicant alleges that Brunner et al. does not teach or suggest a method comprising identifying a center of mass or a body part of the animal based on the images taken from a top view (See Remarks, Page 3 line 22 through Page 4 line 1). Examiner respectfully disagrees.

As it is disclosed at least in Paragraph [0242], one specific system for assessing behavior of a test subject in accordance with the present invention comprises a single video unit **2**. The addition of a second or a third camera is merely an option. Therefore, an embodiment wherein only one camera is present is disclosed in part at least in Paragraph [0242]. Also, all the information needed in order to identify a center of mass and characterize the behavior of an animal is taken from a top camera **1502** shown in Figures 15 and 16 (Paragraph [0281]). The provision of additional cameras (optional embodiments) is used to view the animal in profile. None of the information provided by side-view cameras **1605** is used to neither identify nor characterize behavior, since all the information needed to perform these steps has been already provided by the top camera **1502**.

The Image Segmentation Module **1424** takes video image and subjects the data to a 2D Model Fitting **1426** where the center of mass is labeled (Paragraphs [0295] and [0296]. There is no teaching or suggestion that the information collected from non-visual detectors is used in combination with video data to identify at least a center of mass (See Remarks, Page 3 lines 20-22). Therefore, there is disclosed an embodiment

wherein a single video unit is used, and wherein the location of this video unit is at the top of an animal habitat (Figures 15 and 16).

Therefore, the rejections are maintained.

With respect to claims 46 and 47, Applicant's arguments have been fully considered but they are not persuasive. Applicant alleges that the "programmable" zones by Godhalekar et al. are real and do not form a "user defined virtual zone" (See Remarks, Page 5 lines 20-22). Examiner respectfully disagrees.

As explained in the specification, the virtual zones are not physical. The virtual zones are zones created by the user using graphic tools. One implementation of a dynamic maze is shown in Figure 2A. The Programmable Floor **215** can be programmed in such a way that the user is capable of drawing paths wherein the animal test subject **260** is able to traverse. Even though obstacles are present in the maze, there is no mention of these obstacles having physical dimensions (such as height) for example. These obstacles can be in the form of electric current at the floor plates. Therefore, information regarding animal's position within the maze is captured. Again, this maze is user defined and can be comprised of no obstacles at all, or obstacles represented by electrified floor plates (Col. 5 line 20 through Col. 6 line 12).

Therefore, the rejections are maintained.

With respect to claims 43-45, 48-56, 58-74 and 76-82, Applicant's arguments are no different from those previously presented with respect to claims 42, 57 and 75, and already addressed above.

Therefore, the rejections are maintained.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. TORRES whose telephone number is (571)270-1356. The examiner can normally be reached on M-F: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

/JOSE M. TORRES/
07/30/2008
Examiner, Art Unit 2624